The Blurb

Newsletter of The Phil-Mont Mobile Radio Club

62 Years of Public Service, 1949 to 2011

Volume 61 Number 4 www.phil-mont.org April 2011

FCC approves new mode, CSSC, & lifts all power limits!

On April First don't worry about the *Jokester*, turn your attention instead to …

The *Ham*ster

AKA Bob Thomas, W3NE *see page 5*

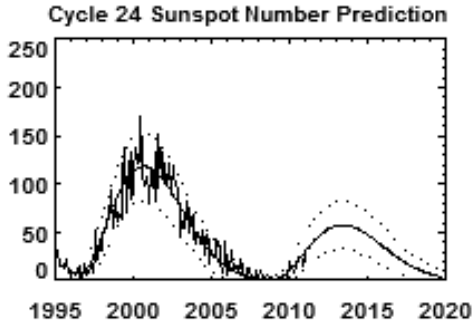
Just when you thought it was safe to go back in the shack!

Get your order in early for Field Day shirts, pins, hats

See page 7

Little Ice Age? Poor progagation? Pesky sunspots!

Current prediction for the next sunspot cycle maximum gives a smoothed sunspot number maximum of about 58 in July of 2013. We are currently over two years into Cycle 24. The predicted size would make this the smallest sunspot cycle in nearly 200 years. *Rats - ed*



Read more at http://solarscience.msfc.nasa.gov/SunspotCycle.shtml

The Blurb is published monthly by and for the members of The PHIL-MONT MOBILE RADIO CLUB, Inc., whose purpose is to promote Amateur Radio in general, and Mobile Radio in particular. ***Copying and quoting*** is permitted with a credit line. We gladly exchange publications with other amateur radio clubs. Requests should be sent to the Editor. ***Subscriptions*** are available to non-members for $12, addressed to the Treasurer.

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WA3KIO (11)
N3XKE (11)
KB2ERL (12)
W3STW (12)
WU3I (12)
ND3B (A)

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For club information: Contact any club officer, or the repeaters listed below. Address or club directory changes and articles for the membership e-mail list should be sent to: KB3IV

Sunday Morning Net Schedules

- **2 Meter/ 70cm Net**..... at 0930L on W3QV repeater
- **10-on-10 Net** ..... at 1000L 28.393 MHz USB (±QRM)
- **75 meter Net** ..... at 1020L 3.993 MHz LSB
- **ARES** at 2100L on the W3QV repeater

Committees

Archives: NG3P	DX: N3MT	Net Control: KB3IV	Scholarship: W3RM
Audit: NS3K	Emerg.Coor: K3HWE	Publicity: W3RM	Skywarn: WX3PHI
Blurb folding: KB3IV & N3GLU	Field Day: KE3QB	Program: Club VP	Sunshine: N3GLU
Directory: KB3IV	Internet: N3QV & KC2PMW	Public Service: KE3QB	VE Program: NS3K
	Membership: N3XKE	Refreshments: W3AOK	Welcome: N3UBY
		Repeater: W3AOK	Youth: N3MT

All visitors are welcome!

The club meets at 7:30 PM on the *second* non-holiday Wednesday each month except July and August at **Roxborough Memorial Hospital,** 5800 Ridge Avenue, Philadelphia, PA 19128
Maps and directions are available at www.phil-mont.org.

License Examinations are held on the fourth **non-holiday Thursday** each month at **Community Ambulance Association, 1414 E. Butler Pike, Ambler PA 19002**
Registration begins at 7:00 P.M. Applicants should contact Jim McCloskey NS3K at 215-275-2979 or jmccloskey@msn.com for the latest information.

Club Stations **W3QV/R: The Jim Spencer Memorial Repeater System**
Ridge & Port Royal Avenues, Philadelphia, PA ***Trustee:*** **W3RM**
147.03 MHz + PL 91.5 Hz 444.80 MHz + PL 186.2 Hz
Reach us on EchoLink through W3QV-R
W3AA *Trustee:* WU3I
W3EM: Field Day/special event station *Trustee:* N3QV

The Officers

Pres: **KB3IV Ed Masarsky** 310 Saw Mill Ln. Horsham PA 19044 kb3iv@comcast.net
Vice Pres: **N3QV Eric D. Marano,** PO BOX 233, Skippack PA 19474 n3qv@arrl.net
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Asst. Treas: **N3MT Michael P. Taraborrelli** michaelmt_1999@yahoo.com

The Prez Sez …

Hello Phil-Mont,

We had a wonderful program at the March club meeting. It was presented by Al, W3STW (Mr. no Dr. Satellite). Al brought us up to date about the workings of amateur radio satellite communications. It sure has changed since I made contacts from W3AA/W3TKQ. If you want to see and operate this mode, come to Field Day the last weekend in June. Al will have his station up and running. He is a great teacher and will be pleased to spend time with anyone interested in this topic. I'm sure he will also be available to show you the ins and outs of the current digital modes being used currently.

Speaking of club meetings, don't miss the April meeting. Our guest speaker will be Dr. Dennis Silage, K3DS, who will present a program on EZNEC Antenna Modeling Software. There are a lot of members contemplating construction and deployment of antennas at their stations. This information should prove to be valuable in doing the right thing the first time. Maybe I will be able to add some new designs to my indoor antenna farm. I have included a short bio on Dennis at the end of my column. *(See page 5 - ed.)*

Welcome back, Carmen. Glad to hear you are recovering and back on the road and the radio with your boys. I know you are looking forward to the upcoming MS Walks and Field Day. I think it's time for another family member to become a ham, he sounds better than you do on the radio.

Speaking of Field Day, shirts can be ordered directly from the ARRL. They are offering a new style shirt this year. No more tee shirts. They will be Golf Shirt style and look great. The club will not be ordering them for individual members. I urge you to order early so you are not disappointed that they run out of stock before the end of June. Please check elsewhere in this issue of the Blurb for information and a link to the ARRL order and information page. They also have other Field Day items available that you might want to buy.

Your April Blurb arrived in an envelope along with the 2011 Club Directory. Please take a minute to check your listing to see if all the information is correct. If you have any changes let me know and I will list them in the supplement due out in the fall. I also would welcome any input about the format of the directory to make it more user friendly. I am not looking for more work. Someone once said," If it works, don't fix it".

de Ed, KB3IV

Phil-Mont
Birthdays & Tidbytes

April Birthdays

05 Robert Moore N2RM
06 Andrew Furlong KC2PMW
08 Jackie Chedeville (XYL) W3GQD

13 Michaela Uebelhoer KB3UFY
15 Kent Simmons N3BKR
15 Joan Clifford (XYL) W3UY

22 Susan Hoch (XYL) WU3I

28 Gwen Patton NG3P
30 Al Kaufmann K3ZMJ

Membership Stats

At press time PMRC had:
85 Full Paid Members
4 Youth Members
1 Honorary Member

ARRL VEC

This month's Thursday evening VE session is the 21st.

As always, many thanks to our VE team!

From the Secretary

PMRC BoD Meeting Minutes, March 9, 2011

The March meeting of the Phil-Mont Board of Directors, postponed from March 2, was held on March 9, immediately prior to the General Meeting, at Roxborough Memorial Hospital. President Ed Masarsky, KB3IV, called the meeting to order at 1920 hours, with the following additional directors in attendance and voting: Bill, W3AOK; Rick, ND3B; Bob, KB2ERL; Jen, KB3MIV; Dick, W3RM; Al, W3STW; and Gene, N3XKE.

Treasurer, W3RM, reported on the club's finances. Dick stated that dues have been received to date from approximately 80% of the membership. He also reported on the income received from the January Auction-Fest, and Scholarship Fund contributions. Ed, KB3IV, reviewed the list of non-members to whom complimentary Blurbs are sent, ie., ARRL officials, area clubs, Scholarship Fund donors, etc. Some outdated subscriptions were eliminated, where appropriate.

Bill, W3AOK, reporting for the Repeater Committee, updated the board on the antenna

improvement/replacement project. Work will proceed as soon as all the ordered material is received. The committee is also investigating a possible Bucks County off-site receiver location to replace the Southampton site, which had to be removed when the host building was sold.

Ed, KB3IV, reported on the planning for April and May general meeting programs. The board meeting was adjourned at 2000 hours.

de Al, W3STW, Acting Secretary

PMRC General Meeting Minutes, March 9, 2011

Ed, KB3IV, called the meeting to order at 1945.

18 people were present, four were guests. KB3IV opened with memories about SK Gene Pressler. W3RM spoke about the scholarship program. KB3IV mentioned the recent contest, which he was impressed. KB3IV reminded everyone that Field Day is right around the corner. We rented two sites this year. There are also MS events coming up all throughout the year. There are updates on the website. There are walks listed and also where volunteers are needed. Spring brings several Hamfests in the next several weeks. ND3B reminded everyone about daylight savings. KB3IV introduced Mr. Satellite, W3STW, up to start the program for the evening. W3STW spoke about the different satellites and the directions they are going for the future. W3STW ended the program stating if anyone had any questions or were interested in working with satellites to contact him. Next month's program will be presented by K3DS concerning antennas.

KB3IV ended the meeting at 2110.

de Jen, KB3MIV

About K3DS

Originally licensed as WN2LGJ in 1963. Calls held include WB2LGJ, WB3AYR, and G5EMU. Trustee of the Temple University Amateur Radio Club K3TU. Professor of Electrical and Computer Engineering at Temple University, teaching undergraduate and graduate courses in digital signal processing, digital data communications, system-on-chip and advanced processor computer systems

Supervised undergraduate ECE senior design projects using amateur radio: satellite antenna tracking (1987), doppler shift correction (1988), WEFAX (1989), binary frequency shift keying (1990-91), direct sequence and frequency hopping spread spectrum (1995-98) software defined radios (1999-2001), digital voice (2002-2003), Mars 'Rover' (2004), software defined radio modem (2009). See the TUARC K3TU website www.temple.edu/K3TU.

Technical committee chair of the Mid-Atlantic Amateur Radio Club WB3JOE and the Delaware County Amateur Radio Association W3UER repeater systems.

Life member of the ARRL. Former Technical Coordinator of the Eastern Pennsylania Section of the ARRL (1992-1998) and Assistant Director of the Atlantic Division of the ARRL (1998-2002). Recipient of the 2001 ARRL Atlantic Division Technical Achievement Award.

Radio Stores … 'N' More

by Bob Thomas, W3NE

CSSC AMPLITUDE MODULATION

Super Power Ham Rigs Now Legal

Dr. Irving O'Reilly, Chief Research Scientist at the Sandia National Laboratories in New Mexico, described an astonishing new development in the April *Proceedings of the IEEE* that is destined to revolutionize radiotelephone transmission technology and open a new frontier in amateur radio. Fifteen years of intensive research by Dr. O'Reilly and his team has resulted in the invention of Cancelled Sideband Suppressed Carrier (CSSC) amplitude modulation. CSSC is the culmination of 102 years of progress in improved efficiency of amplitude modulation transmission and reception. A brief history of the development of earlier forms of AM will set the stage for a detailed explanation of this incredible new advance in communications.

Although the dawn of radio sound transmission is often assumed to have been an era of groping cut-and-try, that was hardly the situation. Reginald Fessenden transmitted conventional amplitude modulated high power RF in 1909. By 1918, Bell Telephone engineers understood the fundamentals of single sideband modulation (SSB), which they developed to increase channel capacity of under-sea cable circuits. Successful use of SSB for short wave radio transmissions was delayed until 1930 due to stability issues, but thereafter it became the mode of preference for commercial users. A few hams had SSB rigs on the air in the 1930s**,** but it was not until the late 60s that SSB began its domination of amateur radio. Early "Modulation Wars" were interesting and full of disparaging remarks about Donald Duck on one side and the futility of "transmitting a whistle" on the other. None of that matters now with CSSC – partisans of both camps will have their way!

A brief review of amplitude modulation will help understanding the subsequent explanation of CSSC. Amplitude modulation of a radio frequency by an audio signal produces three output frequencies: The original frequency (carrier) and two sidebands. The sidebands are offset above and below the carrier by a frequency equal to the audio frequency. In a basic AM system, audio is recovered in a receiver by heterodyning the sidebands with the carrier in a detector. Except for their frequency displacement from the carrier, both sidebands contain precisely the same information. The carrier contains no information **–** it is present only for use as a reference for detection of sideband information, and therein lies the basic advantage of SSB: If the carrier does not contain any information, why transmit it? Simply transmit one sideband and generate a pseudo-carrier in the receiver to detect it. The total power in both sidebands is one quarter of

the power in the carrier, or only-eighth of the total power transmitted by standard AM. Thus, if only one sideband is transmitted, SSB advocates claim an 8dB gain in efficiency. On the other hand, AM enthusiasts are quick to counter that the presumed 8dB advantage does not consider noise affecting the lower amplitude of a single sideband. Those divergent positions are in exact agreement with Kozanowski's Theorem which states "Figures don't lie but liars can figure."

Signal processing in a CSSC transmitter begins the same as in a conventional SSB rig. Audio amplitude-modulates a carrier in a singly-balanced ring modulator, resulting in upper and lower sidebands without the carrier. In a conventional SSB Tx one of those sidebands is selected by a filter, amplified, and transmitted. In DSSC, however the two sidebands are fed to separate inputs of a digital signal processor. The DSP outputs a new pair of analog upper- and lower-sidebands, each with a passband extending outward from the original carrier frequency. The new sidebands, now identical in all respects, each containing a zero frequency reference corresponding to the carrier frequency, are fed through buffer amplifiers to inverting and non-inverting inputs of a Differential Class B power amplifier. Since both sidebands contain identical information and now occupy exactly the same frequency spectrum, they appear to cancel each other in the differential final amp. In fact, a meter in the transmission line from the final amplifier to an antenna or dummy load will indicate zero RF current regardless of modulation level.

Although the sidebands are nominally cancelled within the final amplifier, Irving O'Reilly's research has shown they continue to exist as *virtual sidebands* that can be radiated by an antenna, reflected by the ionosphere, picked up by a suitable receiver, and converted back to the original audio! For the ham operator, this means transmitters can be operated at almost unlimited high power and still comply with Part 97 of FCC regulations for maximum PEP *output* power from an amateur transmitter of 1500 watts, which, according to Part 97, can be measured only with an RF ammeter or calibrated wattmeter. With CSSC, those instruments will read zero power at full modulation even if the differential linear amplifier is operated with 20kW d-c into the final. There is a practical limit to amateur power input, however, because spurious modulation products are generated that can be measured by conventional instruments. Nevertheless, we can look forward to solid DX contacts while running legal superpower. Two W6 hams on Irving O'Reilly's development team are upgrading their domestic electrical service to 440 volts/50 Amps 3-phase in anticipation of being the first 20kW CSSC superpower stations on the amateur bands

Detection of this new signal format involves technology as radically new as its transmission. Looking back for a moment, when only one sideband is transmitted with suppressed carrier, all that is required for detection of the audio is a locally-generated carrier, e.g., BFO in a normal AM receiver or VFO-derived local carrier in a typical SSB transceiver. That local carrier need only have a frequency exactly the same as the original carrier; its phase relative to the original carrier doesn't matter. However, double sideband suppressed carrier systems require means in the receiver to generate a new local carrier that is in phase with the original carrier. To synthesize an in-phase local carrier in a DSSC receiver, the two virtual sidebands are first recovered by a standard diode detector. Then, since the sidebands have a specific relationship with their carrier back in the transmitter, they contain information that can be extracted to generate a new local carrier identical to the original in both frequency and phase. That complex feat is accomplished elegantly in a single LSI chip using a Fast Fourier Transform. The FFT chip separates the combined sidebands then applies an algorithm to each of them to synthesize a new carrier with correct frequency and phase.

Several practical efforts are underway to ensure acceptance of CSSC. The International Telecommunications Union (ITU) has established *A3W* as the worldwide designation for CSSC phone transmissions (A3E is the designation for normal AM). Also, because the high power advantage now makes the new format attractive for modulated-code (MCW), the ITU has established *A2X* to designate CSSC for MCW transmission. For its part, the ARRL is aggressively modifying contest and award

rules to incorporate CSSC operation in an equitable manner along with legacy modes, such as AM, SSB and CW that are expected to survive for several more years. And finally, a consortium of IBM, Intel and MFJ is readying software, LSI chips, and circuit design, respectively, to ensure interchangeability of CSSC signals among all users.

At one time high power AM stations came on the air with the dull *Thunk!* of the antenna relay. Background noise, splatter, and heterodynes disappeared, and there was complete silence except maybe for a ticking clock, water dripping from a leaky faucet, or termites chomping on the floor joists. When the operator spoke, his voice boomed forth with deep resonant bass and clear wideband highs. That all went down the drain when SSB came in with its draconian low- and high-frequency cutoffs and excessive processing. In the near future though, CSSC will deliver 20 Hz – 15 kHz audio so hams will finally sound like humans, not a synthesizer in a computer. Receiver tuning will be precise and automatic; no more audio spectrum shifting in nets by stations that just can't seem to get on the same frequency as everybody else.

Virtual sideband transmission by CSSC will usher in a new era in ham radio. The only downside will be DX hogs and the moron that transmits without listening!

The repeater antennas need some TLC and it ain't gonna be cheap! We're looking for fundraising ideas to replenish the coffers after repairs are paid for. To contribute ideas, or cash, please contact any officer or board member listed on page2.

I just went outside to take a break from slaving over a hot word processor. It's snowing at Blurb headquarters. I'm tired of it.
That is all.
73 de ND3B

The club will not be involved in obtaining Field Day paraphernalia this year. The ARRL has a selection of items available at their online store including hats, shirts, pins and mugs.

To learn more and order go to: http://www.arrl.org/shop/Field-Day-Supplies/

For Sale

6 foot telephone relay rack on castors,
Optoelectronics FC-50 frequency counter,
ARRL handbooks 1933 - onward
Kreco 10 meter coaxial vertical antenna,
Antique headphones,
Multimeters, old technical books and parts.

Contact Tom Bohlander WA3KLR, 215-536-1331

Please feel free to forward to other clubs of which you are a member

April at PMRC …

1st	*Fri - April Fools!*
3rd	*Sun – N3OWM NCS*
	Don't go to work unless it's fun day
6th	*Wed – Board Meeting*
10th	*Sun – KB3SJV NCS*
13th	*Wed – General Meeting*
	Blame someone else day
17th	*Sun – KB3IV NCS*
19th	*Tues – Passover begins*
21st	*Thurs – VE Test Session*
24th	*Sun K3XS – NCS*
	Easter Sunday

And don't forget the **ARES** net every Sunday night at 2100L and the new ***Digital Net*** Tuesdays at 1900L, both on W3QV/R

--… …-- -.. . -. -.. …-- -…

Check out this rope for your antenna project –

3/32" Braided Olive Drab - Dacron / Polyester cord

This is a high quality braided polyester cord with a breaking strength of 210 pounds. Proudly Made in the U.S.A.!

This is a gorgeous *solid braid* perfect for dipole antennas. Very low stretch and strong. Will withstand the weather & sun for 7 to 10 years.

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WU3I@ARRL.NET

First Class Mail

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